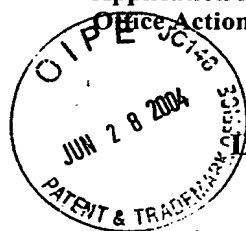


DOCKET NO.: RUCC-0046 (98-0087)
Application No.: 09/743,840
Office Action Dated: September 24, 2003

PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Barbara A. Zilinskas et al.

Confirmation No.: 8791

Application No.: 09/743840

Group Art Unit: 1638

Filing Date: January 17, 2001

Examiner: Helmer, Georgia L.

For: Agrobacterium-Mediated Transformation of Turfgrass

**DECLARATION OF BARBARA A. ZILINSKAS
PURSUANT TO 37 C.F.R. §1.132**

I, Barbara A. Zilinskas, declare as follows.

1. I am a United States citizen residing at 19 Rainflower Lane, Princeton Junction, NJ 08550.

2. I received a Bachelor's degree in Biology in 1969 from the State College at Framingham, Massachusetts, a Master of Science degree in Botany in 1970 and a Ph.D. degree in Biology in 1975, the latter two from the University of Illinois, Urbana. Additional details of my educational background are set forth in my *Curriculum Vitae*, attached hereto.

3. From January-August 1975, I was a Smithsonian Institute Postdoctoral Fellow in the Radiation Biology Laboratory. I have been at Rutgers University, New Brunswick, New Jersey, since 1975, as an Assistant Professor (1975-1980), Associate Professor (1980-1987) and Professor (1987-present) of Plant Biology. Additional details of my professional history are set forth in my *Curriculum Vitae*.

4. I have had over thirty years of scientific training and research experience in the areas of plant biochemistry, cellular and molecular biology. I am the author, co-author or presenter of more than 90 scholarly publications, book chapters, books, invited reviews and

invited lectures, as set forth in detail in my *Curriculum Vitae*. I am or have been a member of numerous scientific committees and advisory boards, including the National Research Council Graduate Fellowship Evaluation Panel (1984-1986); National Science Foundation Metabolic Biology (Cellular Biochemistry) Panel (1986-1989); National Institutes of Health, Special Study Section (1987); USDA National Research Initiative Competitive Grants Program, Photosynthesis/Respiration Program Panel (1992); Environmental Protection Agency, Exploratory Research in Biology Panel (1994). I have served on the editorial board of Photosynthesis Research (1982-1989), and as a reviewer for numerous scientific journals, including Archives of Microbiology, Biochemistry, Biophysical Journal, Biochimica Biophysica Acta, FEBS Letters, Journal of Bacteriology, Journal of Biological Chemistry, Journal of Cell Biology, Journal of Luminescence, Molecular Microbiology, Molecular Plant-Microbe Interactions, Photosynthesis Research, Photochemistry and Photobiology, Plant Journal, Plant Molecular Biology, Plant Physiology, Plant Science, and Proceedings of the National Academy of Science. I was the Project Leader for NEC-49 Cooperative Regional Project on Molecular and Cellular Genetics for Improvement of Agricultural Productivity and Quality.

5. I have been involved in numerous collaborative research projects, as set forth in my *Curriculum Vitae*, and currently conduct research in connection with two commercial collaborative research agreements, one with Scotts Company and Monsanto Company, and the other with Pennington Seed Company.

6. My current areas of research focus on the biochemistry of cellular responses of plants to oxidative stress and turfgrass improvement through genetic modification. My

laboratory is or has been the recipient of over three and one-half million dollars in Federal, State and University grant support to carry out research in these areas.

7. I am a co-inventor of the subject matter covered in the above-referenced U.S. Patent Application Serial No. 09/743,840, entitled "*Agrobacterium*-Mediated Transformation of Turfgrass" (referred to hereinafter as "the present application"), claims 1-10 of which are currently under final rejection in the U.S. Patent and Trademark Office.

8. I have read and am familiar with the Official Action dated September 24, 2003 in the present application. I understand the nature of the rejection made by the examiner concerning alleged lack of enablement by the specification. According to the examiner, a method to achieve successful *Agrobacterium*-mediated transformation of turfgrass is claimed and generally described in the specification, but the working examples do not specifically state that the methods described therein actually resulted in the production of transgenic turfgrass. The examiner further states that, while the specification describes specifics of the method of the invention, those specifics are not set forth in the claims, and therefore the claims are too broad to be practiced by one of skill in the relevant technology, without undue experimentation.

9. Though I do not agree with the examiner's position as summarized above, in the following paragraphs I submit comments regarding the experimental evidence set forth in the present application, for the purpose of clarifying that evidence and showing that one of skill in plant transformation could practice the claimed methods without undue experimentation.

10. First, it is my understanding that the claims of the present application are being amended so that they more clearly state the three primary factors we believe are responsible for our success in transforming turfgrass using *Agrobacterium* vectors. These factors are: (1)

use of strong monocotyledonous promoters within the transformation vector, (2) use of strong *vir* genes, such as those found in the "superbinary" vector systems described by Komari et al. (Plant J. 10: 165-174, 1996) or in U.S. Patent 5,731,179; and (3) use of starting material that produces friable, regenerable callus. By including these three elements in our transformation system and protocols, we have been able to achieve *Agrobacterium*-mediated transformation of several different species of turfgrass, including creeping bentgrass, tall fescue and velvet bentgrass, as set forth in Examples 2-4 of the present specification, as well as other species since the filing of the present application.

11. More specifically, Example 2 of the present application sets forth media and a protocol for transforming creeping bentgrass using *Agrobacterium* vectors in accordance with the methods currently claimed. Example 2 clearly states that calli subjected to the transformation protocol were transferred to a hygromycin-containing selection medium, and that hygromycin-resistant calli, and plantlets regenerated from the calli, were obtained (see page 25 of the specification). Thus, notwithstanding the examiner's belief to the contrary, Example 2 reports that transformed plants were obtained (as based on hygromycin resistance) using the biological materials, media and methods set forth in Example 2. Anyone of skill in plant molecular biology, upon reading Example 2, would understand this to be the case. Nevertheless, in an effort to assuage the examiner's concern regarding the success of the protocols set forth in Example 2, I attest that transformed turfgrass was obtained. Example 2 describes an efficient and reproducible method for production of transgenic creeping bentgrass plants. As a specific example, I shall describe experiment 302/6 in which cultivar Crenshaw creeping bentgrass was co-cultivated with *Agrobacterium* strain pSB111SH on May 27, 1998. The protocol, as described in the patent application, was the one in use at that time. In experiment 302/6, 20 pieces of embryogenic calli, that were approximately 5 mm in

diameter, were co-cultivated with *Agrobacterium* strain pSB111SH that had been pre-induced with acetosyringone. Fourteen of the 20 pieces of calli produced 27 sectors in total that grew under selection with hygromycin. These segments were excised and propagated under continued selection. Of these, 65% survived after repeated rounds of selection on hygromycin. Of those calli that were hygromycin resistant, 81% expressed the transgene product, β -glucuronidase (GUS), and stained blue when a portion of the callus was provided with the appropriate substrates for the enzyme. All of the hygromycin-resistant, GUS-positive calli regenerated into healthy plants when they were placed on regeneration media. In this experiment, there were eight morphologically normal plants that were both hygromycin-resistant and GUS-positive per gram fresh weight of callus subjected to co-cultivation. DNA was extracted from leaf tissue from regenerated plants and was subjected to Southern hybridization analysis. The number of loci in which the transgenes inserted ranged from one to six, with the majority of the plants containing less than three copies of the transgene. Eventually, the plants were vernalized and allowed to cross-pollinate in controlled greenhouse conditions. The presence of the transgenes in the progeny was verified by Southern hybridization; the transgenes were shown to be inherited in a Mendelian fashion.

12. Likewise, Example 3 of the present application sets forth media and a protocol for transforming tall fescue using *Agrobacterium* vectors in accordance with the methods currently claimed. Example 3 also clearly states that calli subjected to the transformation protocol were transferred to a hygromycin-containing selection medium, and that hygromycin-resistant calli, and plantlets regenerated from the calli, were obtained (see pages 28-29 of the specification). Further, some of the hygromycin-resistant callus was tested for expression of GUS activity. Again, I attest that we obtained transgenic turfgrass as evidenced

by hygromycin-resistance and production of GUS. I further attest that we also examined that the transgenes had integrated into the plant genomic DNA by Southern hybridization analysis. As was the case with creeping bentgrass, most of the transformed plants had less than three copies of the transgene inserted into their genomes.

13. Similarly, Example 4 of the present application sets forth media and a protocol for transforming Velvet Bentgrass using *Agrobacterium* vectors in accordance with the methods currently claimed. Example 4 also clearly states that calli subjected to the transformation protocol were transferred to a hygromycin-containing selection medium, and that hygromycin-resistant calli, and plantlets regenerated from the calli, were obtained (see pages 30-31 of the specification). Further, some of the hygromycin-resistant callus was tested for expression of GUS activity to ensure that transformation had been obtained. Again, I attest that we obtained transgenic turfgrass as evidenced by hygromycin-resistance and production of GUS. I further attest that we also examined integration of the T-DNA containing the *hph* and *gus* genes into the plant nuclear DNA by Southern hybridization analysis. Again, the expected few number of insertion loci was observed.

14. For at least the reasons set forth above, I am of the opinion that the instant application more than adequately teaches the skilled person how to achieve *Agrobacterium*-mediated transformation of a variety of turfgrasses, in accordance with the methods that are claimed. I also believe that the information we provided in the specification imparts a reasonable expectation of success in practicing our invention, inasmuch as we presented three working examples in which we successfully transformed three different species of turfgrass.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issued thereon.

June 23, 2004
DATE

Barbara A. Zilinskas
BARBARA A. ZILINSKAS

Barbara A. Zilinskas

Address: Department of Plant Biology and Pathology
59 Dudley Road
Room 296D - Foran Hall
Cook College, Rutgers University
New Brunswick, NJ 08901-8520
Phone: 732/932-9711 ext. 232 FAX: 732/932-9441
Email: zilinskas@aesop.rutgers.edu

Education: B.A. in Biology, State College at Framingham, Massachusetts, 1969
M.S. in Botany, University of Illinois, Urbana, IL, 1970
Ph.D. in Biology, University of Illinois, Urbana, IL, 1975

Professional Experience:

Part-time Laboratory Technician, Department of Environmental Sciences, University of Massachusetts, 1968-1969
NASA Graduate Fellow, University of Illinois, 1969-1972
Research and Teaching Assistant, University of Illinois, 1972-1974
Smithsonian Institution Postdoctoral Fellow, Radiation Biology Laboratory, January - August, 1975
Assistant Professor, Department of Biochemistry and Microbiology, Cook College, Rutgers University, 1975-1980
Graduate Faculty, Full Member, 1976-present
Adjunct Professor, Southern Illinois University, Carbondale, IL 1980-1981
Associate Professor, Department of Biochemistry and Microbiology, Cook College, Rutgers University, 1980-1987
Visiting Scholar, Harvard Biological Laboratories, Harvard University, 1982-1983
Professor, Department of Biochemistry and Microbiology, Cook College, Rutgers University, 1987-1993
Professor, Department of Plant Science, Cook College, Rutgers University, 1993-2001
Professor, Department of Plant Biology and Pathology, Cook College, Rutgers University, 2001-present

Fellowships and Awards:

National Aeronautics and Space Administration Fellowship, 1969-1972
Robert Emerson Memorial Grant for Excellence in Teaching, 1974
Smithsonian Institution Postdoctoral Fellowship, 1975

Rutgers University Merit Awards in 1976, 1982, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1992, 1993, 1994, 1998, 1999, 2000, 2001 and 2002
First Cook College Annual Award for Sustained Academic Professional Excellence, 1990
NJAES Research Award for Active and Original Research, 1994

Warren Sussman Award for Excellence in Teaching, 1995
USDA National Award for Excellence in College and University Teaching in the Food
and Agricultural Sciences, 1996
Rutgers Award for Programmatic Excellence in Undergraduate Education, 1997
Cook College Leadership Award for Excellence in Teaching and Advising, 1999
Alpha Zeta Professor of the Year, 2002
Rutgers University's Scholar-Teacher Award, 2003

Honors:

B.A. Magna cum laude
Kappa Delta Pi (National Honor Society in Education)
American Men and Women of Science
Outstanding Young Women of America
Who's Who of American Women
Who's Who in Science and Engineering
Inclusion of my Research Program in the U. S. House of Representatives Appropriations
Hearings
Cited in BARD (U.S.- Israel Binational Agricultural Research and Development Fund) Twenty
Year External Review for "Outstanding BARD-supported work"

Advisory Boards:

National Research Council Graduate Fellowship Evaluation Panel, 1984-1986
National Science Foundation Metabolic Biology (Cellular Biochemistry) Panel, 1986-1989
National Institutes of Health, Special Study Section, 1987
USDA National Research Initiative Competitive Grants Program, Photosynthesis/Respiration
Program Panel, 1992
Environmental Protection Agency, Exploratory Research in Biology Panel, 1994

Professional and Honorary Societies:

American Association for the Advancement of Science
American Society of Plant Biologists
International Society for Plant Molecular Biology
Kappa Delta Pi, National Honor Society in Education
Sigma Xi, Scientific Research Society

External Grants:

American Chemical Society, Petroleum Research Fund Grant, 1977-1980 (\$9,000) (B. Zilinskas,
Principal Investigator)
USDA Competitive Grant, 1978-1980 (\$80,000) (Co-Principal Investigator, R. F. Troxler;
\$40,000 awarded to B. Zilinskas)
USDA Competitive Grant, 1980-1982 (\$55,000) (B. Zilinskas, Principal Investigator)
NSF Equipment Grant, 1980 (\$25,600) (R. Niedermann, Principal Investigator; B. Zilinskas and

A. St. John, Co-Principal Investigators)
 NSF Equipment Grant, 1981-1982 (\$40,000) (B. Zilinskas, Principal Investigator)
 USDA Competitive Grant, 1982-1984 (\$100,000) (B. Zilinskas, Principal Investigator)
 USDA Competitive Grant, 1985-87 (\$85,000) (B. Zilinskas, Principal Investigator)
 USDA Competitive Grant, 1987-90 (\$160,000) (B. Zilinskas, Principal Investigator)
 USDA Special Grant, 1987-89 (\$73,900) (B. Zilinskas and E. Brennan, Co-Principal Investigators)
 USDA Special Grant, 1989-1992 (\$117,348) (B. Zilinskas and E. Brennan, Co-Principal Investigators)
 NSF Grant, 1989-1994 (\$212,158) (B. Zilinskas, Principal Investigator)
 NSF Research Experiences for Undergraduates Grant, 1990-91 (\$32,929) (P. Day and B. Zilinskas, Co-Principal Investigators)
 USDA NRICGP Grant, 1991-1994 (\$170,000) (J. Macmillan and B. Zilinskas, Co-Principal Investigators)
 USDA NRICGP Grant, 1992-1994 (\$120,000) (B. Zilinskas, Principal Investigator)
 Rockefeller Foundation Grant, 1992-1993 (\$10,000) (B. Hillman, B. Zilinskas, P. Day and P. Smouse, Co-Principal Investigators)
 NSF Grant, 1992-1993 (\$6,000) (B. Hillman, B. Zilinskas, P. Day and P. Smouse, Co-Principal Investigators)
 NSF-IRL Grant, 1993-1995 (\$54,948 from NSF; \$54,948 University Match) (B. Zilinskas, Principal Investigator)
 BARD Grant, 1993-1997 (\$263,000) (B. Zilinskas, Principal Investigator; D. Holland, Y. Eshdat, and G. Ben-Hayyim, Co-Principal Investigators)
 EPA Grant, 1993-1998 (\$361,002) (B. Zilinskas, Principal Investigator)
 NJ Department of Education, 1997-1999 (\$24,592 subcontract to Rutgers University from city of Paterson, NJ) (B. Zilinskas, Principal Investigator of subcontract)
 USDA Higher Education Challenge Grant, 1998-2001 (\$75,671 matched by Cook College and Rutgers University) (B. Zilinskas, Principal Investigator; G. Zylstra and H. Pederson, Co-Principal Investigators)
 High-Technology Workforce Excellence Grant, 2000-2003 (\$1,342,750 from the State of New Jersey) (G. Zylstra, Principal Investigator; B. Zilinskas, M. Haggblom, and C. Pray, Co-Principal Investigators)
 NSF Equipment Grant, 2003-2004 (\$40,250) (N. Tumer, Principal Investigator; E. Lam, T. Leustek, G.J. Zylstra, J. Kukor, M. Lawton and B. Zilinskas, Co-Principal Investigators)

Collaborative Research Agreements:

Scotts Co. and Monsanto Co., 2003-2006 (\$450,000) (B. Zilinskas, Principal Investigator; W. Meyer, Co-Principal Investigator)
 Pennington Seed, 2004-2009 (\$536, 506) (B. Zilinskas, Principal Investigator)

Travel Grants:

NATO Advanced Study Institute in Photobiology, Italy, 1972 (NSF)
 International Photobiology Congress, Italy, 1976 (NRC)
 International Photosynthesis Congress, England, 1977 (NSF)
 Twenty-Sixth International Plenary Meeting on Space Research, France, 1986 (COSPAR)

Internal Grants (B.A. Zilinskas, Principal Investigator, unless otherwise noted):

Biomedical Sciences Support Grant, 1975 (\$5,000); 1976 (\$4,700); 1978 (\$5,000); 1979 (\$2,500); 1980 (\$1,500)
Research Council Grant, 1977 (\$3,000); 1978 (\$750); 1978 (\$1,000); 1981 (\$1,500); 1982 (\$1,620); 1984 (\$3,000); 1986 (\$3,000); 1988 (\$2,500); 1992 (\$1,500)
Busch Grant, 1980 (\$7,000); 1981 (\$7,000); 1982 (\$4,000); 1984 (\$5,000); 1986 (\$5,000)
FASP Research Council Grant, 1982 (\$700)
Instructional Excellence Grant, 1986 (\$12,000)
Center for Interdisciplinary Studies in Turfgrass Science, 1992-1994 (\$154,109) Co-Principal Investigator with P. Day, L. Lee, C-K. Chin and G. Jelenkovic
Center for Turfgrass Science, 1996-1997 (\$24,282)
Center for Turfgrass Science, 1997-1998 (\$28,925)
Center for Turfgrass Science, 1998-1999 (\$73,912)
Reinvest in Rutgers University Initiative, 1998-1999 (\$38,622)
Center for Turfgrass Science, 1999-2000 (\$87,296)
Advisory Committee on Instructional Computing, 2000 (\$38,000) (G. Zylstra, Principal Investigator; B. Zilinskas one of several Co-Principal Investigators)
High Technology Workforce Excellence Grant, 2000-2003 (\$216, 650 in Institutional Support) (G. Zylstra, Principal Investigator; B. Zilinskas, M. Haggblom and C. Pray, Co-Principal Investigators)
Special Allocation to Advance Strategic Initiatives, 2000-2001 (\$41,457)
NJAES REG Initiative, Chemiluminescent Imaging in Molecular Biology, 2000-2001 (\$30,000) (W. Cohick, Principal Investigator; B. Zilinskas, one of several Co-Principal Investigators)
NJAES REG Initiative, Biotechnology Support Facility, 2001-2002 (\$180,000) (G. Zylstra, Principal Investigator; B. Zilinskas, one of several Co-Principal Investigators)
Center for Turfgrass Science, 2001-2002 (\$31,000)
Center for Turfgrass Science, 2002-2003 (\$45,582)
Reinvest in Rutgers Grant, 2002-2003 (\$25,000) (G. Zylstra, Principal Investigator; W. Cohick and B.A. Zilinskas, Co-Principal Investigators)

Courses Taught:

Advanced Studies in Biochemistry 16:115:606, 1975 (50%)
General Biology 01:119:101, 1975-85 (30-50%)
Plant Physiology Laboratory 11:780:382, 1976 (100%) (3 sections)
Photobiology 01:119:412, 1977-87 (50%)
Plant Physiology 16:131:501, 1979-89 (40%)
Methods in Plant Metabolism 16:131:521, 1980 (50%)
Honors Seminar 11:554:196, 1981 (100%)
Seminar in Biochemistry 16:115:614, 1985 (100%)
Plant Molecular Biology 11:126:413, 1985-2001 (50-100% and Course Coordinator)
Methods in Recombinant DNA Technology 11:126:427, 1988-present (50-100%) (2 sections/year)
Research in Biotechnology 11:126: 497, 498, 1988- present (Course Coordinator)
Seminar in Biotechnology 11:126:401, 1991-present (100%) (1-3 sections/year)
Plant Metabolism 16:765:520, 1993 (30%)

Plant Molecular Biology 16:765:513, 1994-2001 (30-50% of lectures and Course Coordinator)
Plant Physiology 16:765:502, 1998-present (10%)
Plant Biochemistry and Metabolism 16:765:520, 1999 (10%)

New Courses Developed:

Photobiology, 01:119:412
Methods in Plant Metabolism 11:131:521
Plant Molecular Biology, 11:780:413
Plant Molecular Biology, 16:765:513
Methods in Recombinant DNA Technology, 11:115:427
Research in Biotechnology 11:126:497, 498
Seminar in Biotechnology, 11:126:401

Developed New Curriculum and Degree Program:

B.S. in Biotechnology, approved by the N.J. Department of Higher Education, January, 1989,
Curriculum Coordinator 1989-present

Advising:

Undergraduate upper-class advisor to biology majors specializing in quantitative biology, 1976-1981; physiology, 1977-1981; genetics and cellular biology, 1983-1991
Undergraduate advisor to biotechnology majors, 1987-present
Undergraduate freshman advisor, 1978-1982 and 2002-present
Research advisor to nine George H. Cook scholars and three Douglass College scholars, 1976-present
Research advisor to twenty other Cook College undergraduates, 1976-present
Faculty sponsor to twenty Cooperative Education students, 1985-present
Curriculum Coordinator, Biotechnology Curriculum, 1989-present
Faculty advisor, Designer Genes, Rutgers University Biotechnology Club, 1993-present
Graduate major advisor and committee chairperson of 12 Ph.D. students and 3 M.S. students, 1975-present
Advisor to an International Atomic Energy Agency research fellow, 1979-1980
Thesis committee member for 57 graduate students, including five students outside Rutgers University, 1975-present
Research advisor of five postdoctoral fellows
Research advisor of eight visiting scientists on sabbatical

Theses Under the Direction of B.A. Zilinskas:

Greenwald, L. S. Allophycocyanin B from *Nostoc* sp. phycobilisomes. M.S. Thesis, 1979
Kyde, M. M. The cyanobacterial heterocyst: its physiology and biochemistry. M.S. Thesis, 1981
Rusckowski, M. The phycobilisome attachment site on the thylakoid membrane of the

- cyanophyte, *Nostoc* sp. Ph.D. Thesis, 1981
- Hays, E. Isolation and characterization of phycocyanin and allophycocyanin from *Aphanothece halophytica*, a halophilic blue-green alga. Ph.D. Thesis, 1981
- Glick, R. E. Structure-function relationships in phycobilisomes and thylakoid membranes in red and blue-green algae. Ph.D. Thesis, 1983
- Greenwald, L.S. Synthetic and degradative processes involving the phycobilisomes, phycobiliproteins and linker polypeptides in *Anacystis nidulans* and *Nostoc* sp. Ph.D. Thesis, 1984
- Kupatt, C. E. Two roles of thylakoid lipids in modifying the activity of herbicides, which inhibit photosystem II. Ph.D. Thesis, 1985
- Philbrick, J.B. Cloning and mutational analysis of *psb 1*, the gene encoding the photosystem II manganese-stabilizing protein, from the cyanobacterium *Synechocystis* 6803. Ph.D. Thesis, 1988
- Scioli, J.R. Cloning and analysis of a cDNA encoding the chloroplastic copper-zinc superoxide dismutase. Ph.D. Thesis, 1988
- Altomare, D.A. Copper/zinc- and manganese-superoxide dismutases in pea: molecular cloning of cDNAs and regulation of superoxide dismutase gene expression. Ph.D. Thesis, 1992
- Mittler, R. Molecular characterization of pea cytosolic ascorbate peroxidase. Ph.D. Thesis, 1993
- Mackle, M. The role of signal peptides in protein targeting in cyanobacteria. Ph.D. Thesis, 1994
- Kuo, M.-C. Spatial and temporal pattern of ascorbate peroxidase and monodehydroascorbate reductase gene expression in pea. M.S. Thesis, 1996
- Murthy, S. Molecular cloning and analysis of pea cytosolic monodehydroascorbate reductase. Ph.D. Thesis, 1996
- Ajit, S. K. Responses of transgenic plants overexpressing antioxidant enzymes to ozone and pathogens. Ph.D. Thesis, 1999
- Wang, X. Advances in turfgrass transformation. M.S. Thesis, 2001
- Hong, M. Role of 16C monounsaturated fatty acids in *cis*-3-hexenal production and plant response to stress, Ph.D. Thesis, 2004

Collaborations (Outside Rutgers University):

- Dr. E. Gantt, Smithsonian Radiation Biology Laboratory, 1975-1976
- Dr. R. F. Troxler, Biochemistry Department, Boston University School of Medicine, 1977-1980

Dr. R. R. Alfano, Physics Department, City College of New York 1979-1985
 Dr. J. Grabowski, Institute of Environmental Engineering, Poznan, Poland, 1981-1982
 Dr. L. Bogorad, Department of Cellular and Developmental Biology, Harvard University, 1982-1983
 Dr. K. Csatorday, Biological Research Center, Hungarian Academy of Sciences, Szeged, Hungary, 1985-1986
 Dr. N. Geacintov, Chemistry Department, New York University, 1985-1992
 Dr. J. Breton, Biophysics Department, Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette, France, 1985-1991
 Dr. C. Dismukes, Chemistry Department, Princeton University, 1988-1992
 Dr. Ersi Galun, Department of Plant Genetics, The Weizmann Institute of Science, Rehovot, Israel, 1990-1996
 Dr. P. Dunsmuir, DNA Plant Technology, Oakland, CA, 1989-1991
 Dr. B. Diner, DuPont, Wilmington, DE 1990-1993
 Dr. Y. Eshdat, D. Holland and G. Ben-Hayyim, Volcani Institute, Bet Dagan, Israel, 1992-1998
 Dr. A. Strid, Department of Biochemistry and Biotechnology, Royal Institute of Technology, Stockholm, Sweden, 1993-1997
 Dr. L. del Rio, Department of Plant Biochemistry, Estacion Experimental del Zaidin, CSIC, Granada, Spain, 1994-1997
 Dr. E. Pell, Department of Plant Pathology, Pennsylvania State University, 1994-2000
 Dr. F. Booker, A. Heagle and J. Miller, North Carolina State University and USDA-ARS, Raleigh, North Carolina, 1995-present
 Dr. C. Mulchi, University of Maryland, 1996-present
 Dr. S. Grace, Louisiana State University, 1996-1997
 Dr. S. Jones-Held, King's College, 1998-present
 Dr. R. Mittler, Iowa State University, 2001-present

Professional Activity (In addition to papers presented at meetings and invited seminar presentations):

Plant Physiology Regional Meeting, 1976, chaired session and assisted in programming of the meeting
 American Society of Plant Physiologists Annual Meeting, chaired session on photosynthesis, 1978
 American Society for Photobiology Annual Meeting, chaired session on phycobiliproteins and regulation, 1979
 American Society of Plant Physiologists, Northeastern Regional Group, Executive Committee member, 1981-1984
 American Society for Photobiology Annual Meeting, organized workshop on education in photobiology, 1983, 1984
 Cold Spring Harbor Symposium, Molecular Biology of the Photosynthetic Apparatus, chaired session on light harvesting systems in cyanobacteria, 1984
 American Society for Photobiology Finance Committee, 1981-1985;
 Executive Council, 1982-1985; Education Committee, 1982-1985; Chairperson, 1983-1985;
 Nominating Committee, 1984-1985; Constitution and Bylaws Committee, 1985-1986
 American Society for Photobiology Annual Meeting, chaired "Works In Progress", 1985

Editorial Board, Photosynthesis Research, 1982-1989
 Reviewer for USDA, NSF, NIH, DOE, and several private foundations
 Reviewer for numerous scientific journals including: Archives of Microbiology, Biochemistry, Biophysical Journal, Biochimica Biophysica Acta, FEBS Letters, Journal of Bacteriology, Journal of Biological Chemistry, Journal of Cell Biology, Journal of Luminescence, Molecular Microbiology, Molecular Plant-Microbe Interactions, Photosynthesis Research, Photochemistry and Photobiology, Plant Journal, Plant Molecular Biology, Plant Physiology, Plant Science, and Proceedings of the National Academy of Science
 Project Leader, NEC-49 Cooperative Regional Project on Molecular and Cellular Genetics for the Improvement of Agricultural Productivity and Quality, 1984-1988
 Associate Editor, Warren L. Butler Memorial Issue of Photosynthesis Research, 1985-1986
 Consultant, International Biotechnologies Incorporated, 1986-1987
 President-Elect, Sigma Xi, Rutgers University Chapter, 1987-1988
 President, Sigma Xi, Rutgers University Chapter, 1988-1989
 Site-Visit to Wellesley College, Biology Department Review, 1988
 Site-Visit to Simmons College, Biology Department Review, 1989
 Invited Speaker, USDA Workshop, Agricultural Biotechnology and the Public, 1988
 Contributor, U.S. Congress Office of Technology Assessment, "New Developments in Biotechnology", 1988
 Invited Speaker and Participant, U.S./Soviet Student Roundtable on Agricultural Biotechnology, 1989
 Invited Speaker and Participant, National Leadership Institute for Teachers of Biology, 1990 and 1991
 Invited Speaker, U.S.-Japan Binational Seminar, Honolulu, Hawaii, 1990
 Project Leader, Northeast Regional Technical Committee, Characterization and Mechanisms of Plant Responses to Ozone in the Northeastern US, 1991-2002; Chair, 1993-1994
 Session Chair, Third International Symposium on Gaseous Pollutants and Plant Metabolism, Blacksburg, VA, 1992
 Invited Speaker and Session Chair, Third International Symposium on Plant Peroxidases, Elsinore, Denmark, 1993
 Invited Keynote Speaker, Sixth International Conference on Superoxide and Superoxide Dismutase, Kyoto, Japan, 1993
 Visiting Professor (one week), University of Puerto Rico, Rio Piedras, 1994
 Invited Speaker, Biotechnology Conference, Center for Talented Youth, New Brunswick, 1995
 Invited Keynote Symposium Speaker, Sixteenth International Botanical Congress, St. Louis, MO, 1999
 Co-Coordinator of Talented Youth Conference, Discovering Biotechnology, Rutgers University, 1999
 Invited Speaker, Johns Hopkins University Center for Talented Youth, College Colloquium, College of New Jersey, 2000
 Chemical Technology Advisory Committee, Burlington County College, 2000-present
 Project Leader, NE-1013, Mechanisms of Plant Response to Ozone in the Northeastern US, 2002-present

University Committees:

Chairperson, Educational Development Committee, 1976-1977
Chairperson, Plant Physiology Search Committee, 1977
Participant of six additional Search Committees, 1976-1984
Cultural Affairs Committee, 1976-1978
Committee for preparation of the Biology Report for Cook College, 1976-1977
Executive Committee, Plant Physiology Graduate Program, 1977-1980
Ad Hoc Committee for a research facility for promoting plant science research, 1977
George H. Cook Scholar Committee, 1979-1982; Chairperson, 1981-1982
Committee for merger of the Plant Physiology and Botany Graduate Programs, 1979-1980
Designed new research laboratory in Lipman Hall and major participant in plans for new teaching laboratories in the Plant Physiology Building, Cook College
General Honors Committee (Cook College), 1980-1982
Curriculum Committee (Biology) of the Graduate School, 1980-1982
Faculty Representative to the Cook College Council, 1980-1981
Admissions Committee, Botany and Plant Physiology Graduate Program, 1980-1981 and 1983-1988
Curriculum Committee, Botany and Plant Physiology Graduate Program, 1981-1982
Marshall, University Commencement, 1982-1996
Instructional Development Survey Committee, 1983-1987
Planning Committee for "Institute for Biotechnology" 1983-1984
Chairperson, Plant Molecular Biology Search Committee, 1984-1985
Industrial - NJAES Plant Science Seminar Committee, 1984-1987
Planning Committee for Biotechnology Curriculum, 1983-1989
Search Committee for Dean/Director of Cook College/NJAES, 1984
Center for Agricultural and Environmental Technology New Building Committee, 1985
Committee on Cellular and Molecular Studies in the Life Sciences, 1985
Committee on Rules of Procedure of the Graduate School, 1985-1988
University Research Council, 1985-1988
Advisory Committee to Graduate School Dean Stimpson on Graduate Studies in Cellular and Molecular Biology, 1986
Fellow of Douglass College, 1986-present
Ad Hoc Committee on Cooperative Education Program, 1987-1988
Ad Hoc Committee on Evaluation of Teaching Effectiveness, 1987-1989
Ad Hoc Committee on Sciences at Douglass College, 1987-1989
CAART Committee, Faculty Liaison, 1987-1988
Appointments and Promotions Committee, 1987-1989
Admissions and Scholastic Standing Committee, 1987-1993
Planning Committee on Biotechnology Outreach Program, 1987-1988
Curriculum Coordinator, Biotechnology Curriculum, 1989-present
Executive Council of the AAUP, Rutgers University Chapter, 1987-1989
AAUP Bylaws Committee, 1988
Academic Standards Committee, Biochemistry Graduate Program, 1987-1990
Search Committee for a Plant Virologist, 1987-1988
Search Committee for Chair of Horticulture and Crop Science Department, 1988-1992
Search Committees (five) for Faculty in Center for Agricultural Molecular Biology, 1988-1992
Grants Workshop Mentor Program, 1988-1989

Executive Committee, Biotechnology Thrust Area, 1988-1989
Search Committee for Plant Biologist, Newark Campus, 1983-1984 and 1989-1990
Affirmative Action and Equal Opportunities Committee, 1989-present; Chair 1989-90;
Vice-Chair 1990-1991
Curriculum Committee, Microbiology Graduate Program, 1989-1994
Curriculum Committee, Biochemistry Graduate Program, 1990-1994
George H. Cook Honors Committee, 1990-1997
Nominations Committee, Plant Biology Graduate Program, 1990-1992
Admissions Committee, Plant Biology Graduate Program, 1990-present
Rutgers University Catholic Center Community Council, 1990-1991
President's Inauguration Committee, 1990-1991
University Radiation-Safety Committee, 1991-present; Chair, 1995-present
Organizing Committee, Symposium on Molecular Biology of Plant-Microbe Interactions,
1990-1993
Douglass College Science Advisory Board, 1991-present
Appointments and Promotions Committee, 1990-1992
Search Committee for Dean of Academic and Student Affairs, 1991
Ad Hoc Committee on Biochemistry, 1992
Executive Council of the Graduate School, 1992-1995
Search Committee for Dean of Research, Cook College, and Director of Research, NJAES,
1992-1993
Mabel Smith Douglass Honors Committee, 1992-1994
Strategic Planning Steering Committee, New Brunswick, 1992-1994
Biotechnology Club Faculty Advisor, 1992-present
Cook College Junior/Senior Colloquium Implementation Committee, 1994-1995
Search Committee for Associate Dean of Research/Associate Director of Research,
NJAES, 1994
Cook College Tuition Differential Committee, 1994-2000; Chair 1999-2000
Biological Sciences Self Study Committee, 1994-1995
Research Award Committee, Cook College, 1995
Search Committee for Dean of Douglass College, 1995
Strategic Planning Implementation Committee for the Life Sciences and Agriculture, 1995-
1996
Foran Hall Phase II Planning and Implementation Committee, 1995-2001
Search Committee for Food Microbiologist, 1996
Faculty Council, 1997-2000
Plant Science Cluster Council, 1997-2001
Search Committee for Assistant Professor of Host-Pathogen Physiology/Plant Molecular
Biology, 1997-1998
Advisory Board for the Douglass Project, 1998-present
Search Committee for Assistant Professor of Microbial Physiology, 1998
Selection Committee for the 1998 Rutgers Award for Programmatic Excellence in
Undergraduate Education, 1998
Selection Committee for the Warren I. Susman Excellence in Teaching Awards, 1998-2001
Advisory Committee to Paterson Public School District, 1998-1999
Search Committee for Microbiol Ecologist, 1998-1999
Faculty Honorary Degrees Committee, 1998-2001
USDA-CARR Committee, 1999-present
Search Committee for Professor of New Use Agriculture, 1999-2000

Search Committee for Food Biology Faculty Position, 1999-2000
 Search Committee for Executive Dean of Cook College, 2000-2002
 Faculty Representative to the Cook College Council, 2001-2002
 Cook College Genomics Initiative Planning Committee, 2001-present
 Ad Hoc Committee of Cook College Curriculum Review, 2002-present
 Cook College Faculty Financial Aid Committee, 2002-present
 Advisory Committee for the Department of Plant Biology & Pathology, 2002-present
 Ad Hoc Plant Biology Teaching Program Improvement Committee, Chair, 2002-present
 Ad Hoc Plant Biology Graduate Program Recruitment Committee, Chair, 2003-present
 Search Committee for Vice President of Student Affairs, 2003-present

Publications:

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- Mohanty, P., B. Zilinskas Braun, Govindjee and J. P. Thornber 1972 Chlorophyll fluorescence characteristics of system I chlorophyll *a* protein complex and system II particles at room and liquid nitrogen temperature. *Plant and Cell Physiol.* 13:81-91
- Mohanty, P., B. Zilinskas Braun and Govindjee 1973 Light-induced slow changes in chlorophyll *a* fluorescence in isolated chloroplasts: Effects of magnesium and phenazine methosulfate. *Biochim. Biophys. Acta* 292:459-472
- Braun, B. Zilinskas and Govindjee 1974 Antisera against a component on the oxygen-evolving side of system II reaction: Antisera prepared against an extract from frozen and thawed chloroplasts. *Plant Science Lett.* 3:219-227
- Zilinskas, B. and Govindjee 1975 Silicomolybdate and silicotungstate mediated DCMU-insensitive photosystem II reaction: Electron flow, chlorophyll *a* fluorescence and delayed light emission changes. *Biochim. Biophys. Acta* 387:306-319
- Zilinskas, B. and Govindjee 1976 Stabilization by glutaraldehyde fixation of chloroplast membranes against inhibitors of oxygen evolution. *Z. Pflanzenphysiol.* 77:302-314
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- Gantt, E., C. A. Lipschultz and B. Zilinskas 1977 Phycobilisomes in relation to the thylakoid membranes. *Brookhaven Symposium in Biology. Chlorophyll-proteins, reaction centers and photosynthetic membranes.* 28:347-357
- Rathnam, C. K. M. and B. A. Zilinskas 1977 Reversal of DCMU inhibition of CO₂ fixation in spinach chloroplasts and protoplasts by dicarboxylic acids. *Plant Physiol.* 60:51-53

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- Zilinskas, B. A., L. S. Greenwald, C. Bailey and P. C. Kahn 1980 Spectral analysis of allophycocyanin I, II, III and B from *Nostoc* sp. phycobilisomes. *Biochim. Biophys. Acta* 592:267-276
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- Doukas, A. G., F. Pellegrino, D. Wong, V. Stefancic, J. Buchert, R. R. Alfano and B. A. Zilinskas 1981 Picosecond absorption and fluorescence studies of the isolated phycobiliproteins from the blue-green alga, *Nostoc* sp. In: *Photosynthesis I. Photophysical Processes - Membrane Energization*. G. Akoyunoglou, ed. Balaban Intern. Sci. Serv., Philadelphia, PA, pp. 59-68
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- Pitcher L., B. Zilinskas and E. Brennan 1991 Ozone-induced changes in Cu/Zn-superoxide dismutase expression in pea. *Phytopathology* 81:123-124
- Mittler, R. and B.A. Zilinskas 1991 Purification and characterization of pea cytosolic ascorbate peroxidase and the molecular cloning of its cDNA. In: *Active Oxygen/Oxidative Stress and Plant Metabolism. Current Topics in Plant Physiology: An American Society of Plant Physiologists Series*. Pell, E.J. and Steffen, K.L. (eds.) Volume 6. Rockville, MD, pp. 268-270

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Ryan, P.A., J.D. Macmillan and B.A. Zilinskas 1997 Molecular cloning and characterization of genes encoding the L₁ and L₂ components of hemolysin BL. J. Bacteriol. 179:2551-2556

Gueta-Dahan, Y., Z. Yaniv, B.A. Zilinskas and G. Ben-Hayyim 1997 Salt and oxidative stress: similar and specific responses in citrus. Planta 203:460-469

Zilinskas, B.A. 2001 The role of biotechnology in improving the turfgrass performance. 2000 Rutgers Turfgrass Proceedings of the New Jersey Turfgrass Expo. A. Gould, ed. pp. 251-253

Krupa, S., M.T. McGrath, C. Anderson, F.L. Booker, K.O. Burkey, A.H. Chappelka, B.I. Chevone, E.J. Pell and B.A. Zilinskas 2001 Ambient ozone and plant health. Plant Disease 85:4-12.

Bick, J.A., A.T. Setterdahl, D.B. Knaff, Y. Chen, L.H. Pitcher, B.A. Zilinskas and T. Leustek 2001 Regulation of plant-type 5'-adenylylsulfate reductase by oxidative stress. Biochemistry 40: 9040-9048

Del Rio, L.A., L.M. Sandalio, D.A. Altomare and B.A. Zilinskas 2003 Mitochondrial and peroxisomal manganese superoxide dismutase: differential expression during leaf senescence. J. Exp. Bot. 54: 923-933

Hong, M., B.A. Zilinskas, D.C. Knipple and C.-K. Chin 2003 *Cis*-3-hexanal production in tobacco is stimulated by 16-carbon monounsaturated fatty acids. Phytochemistry 65: 159-168

Manuscripts in Review:

Ajit, S.K. and B.A. Zilinskas 2004 Oxidative tolerance of transgenic plants which overexpress antioxidant enzymes in the apoplast, submitted to Plant Physiol.

Patent Pending:

Zilinskas, B.A., S. Lakkaraju and L.H. Pitcher *Agrobacterium*-mediated transformation of turfgrass, PCT International Application, filed July, 1999 (U.S. Patent Application 09/743, 840)

Books:

Govindjee, J. Barber, W. A. Cramer, J. H. C. Goedheer, J. Lavorel, R. Marcelle and B. Zilinskas. 1987. *Excitation Energy and Electron Transfer in Photosynthesis*. Martinus Nijhoff Publ., Dordrecht, 518 pp.

Invited Review Articles (refereed):

Zilinskas, B. A. and L. S. Greenwald 1986 Phycobilisome structure and function. *Photosyn. Research* 10:7-35

Zilinskas, B. A. 1987 Environmental influence on photosynthetic efficiency. *Adv. Space Research*. 7:7-16

Chapters in Books:

Govindjee and B. Zilinskas Braun 1974 Light absorption, emission and photosynthesis, In: *Algal Physiology and Biochemistry*, W. D. P. Stewart, ed., Blackwell Scientific Publications, Oxford, England, pp. 346-390

Zilinskas, B. A. 1985 Efficiency and capacity of the photosynthetic light reactions. In: *Biochemical Basis of Plant Breeding, Vol. 1. Carbon Metabolism*. C. Neyra, ed. CRC Press, Boca Raton, FL, pp. 37-58

Mittler, R. and B.A. Zilinskas 2004 Activated oxygen species in multiple stress situations and protective systems. In: *Ecological Studies, Vol. 170. Molecular Ecotoxicology of Plants*, H. Sandermann, ed. Springer-Verlag, Heidelberg, pp. 51-73

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